

Metro Water Services Leakage Control (DMA Analysis and Leak Detection Services)

Client: Metropolitan Government of Nashville and Davidson County

Metro Water Services (MWS) provides water to a population of 545,524 through 155,712 service connections. Two water treatment plants produce 31,026 million gallons of water per year which is distributed by 57 pumping stations through 2,718 miles of water main. The overall goal of this project is to reduce the real losses to the Economic Level of Leakage (ELL) previously calculated in the Water Audit at an Infrastructure Leakage Index (ILI) of 3.3.

Nashville began with an initial 5 year program. During that five years, 271 DMAs were measured and over 1,780 leaks were located wasting over 20,500 gpm (29.7 MGD). WSO is currently in the second year of the second five year contract for loss reduction.

The distribution system has been sectorised into approximately 102 temporary District Metered Areas (DMA) by closing valves within the network. Flow and pressure in each DMA is monitored over a 48-hour period using insertion type metering devices and data loggers.

Large customers with exceptional night use are also logged to measure their actual consumption during the low flow periods normally between about 2 A.M. – 4 A.M. This consumption, along with the other legitimate night time usage, is then deducted from the measured inflow into the district to determine the actual amount of leakage with the district using the Minimum Night Flow (MNF) analysis methodology.

Pressure step testing calculations are also carried out to determine the leakage – pressure relationship in each DMA. This allows WSO to determine the amount of fixed and variable are leakage in the DMA and provides an estimate of the amount of recoverable leakage which can be detected and pinpointed with sonic and leak correlation equipment.

The DMAs are prioritized for leak detection and, if warranted, sonic leak detection is performed by WSO within the DMA to pinpoint detectable leaks. Each detected leak is reported to MWS and their direct labor crews then respond to carry out repairs.

Periodic re-measurements were carried out to determine the rate of rise of leakage. This will provide data to enable calculation of the economic level of leakage intervention. During the current 5 year contract, WSO is attempting to measure all 102 DMAs every year.



